

REMARKS

By this amendment, claims 1 and 9 are amended. The amendments are made to even more clearly define the claimed invention and do not add new matter and are fully supported by the specification. Reconsideration of the rejected claims in view of the above amendments and the following remarks is respectfully requested.

Claim Rejections – 35 U.S.C. §112, second paragraph

The Office Action rejects claims 1, 4, and 6-10, alleging that the claims are indefinite for failing to particularly point out and distinctly claim the subject matter.

Specifically, the Action asserts that the element “the above score” in claims 9 lacks an adequate antecedent basis because it refers to “the matching score” in claim 1 and “calculated scores” in claim 8. Applicant amends claim 9 to recite “said calculated scores,” making clear that the reference is to the “calculated scores” in claim 8. Applicant respectfully requests withdrawal of the rejection.

The Office Action also rejects claim 1 for indefiniteness. The Action asserts that the claims are confusing by referring to “two or more core segment sequences,” but later in the claim, to dividing the protein into “one or more core segment sequences.” Applicant amends claim 1 to recite that the protein is divided into “two or more core segment sequences.” Applicant respectfully requests withdrawal of the rejection.

Claim Rejections – 35 U.S.C. §103

The Examiner rejects claims 1, 4, and 6-10 under 35 U.S.C. § 103(a) as allegedly obvious over EISENBERG et al. (U.S. Patent No. 5,436,850) in view of SOTO-JARA et al. (U.S. Patent No. 5,948,763). This rejection is respectfully traversed.

The Office Action asserts that EISENBERG et al. discloses, explicitly or inherently, most of the elements of Applicant's claimed invention, including the division of the protein into two or more segment sequences. The Action admits that EISENBERG et al. does not disclose that that the division of the reference protein be into two or more segments *that are predetermined to form a hydrophobic core* and into one or more sub segment sequences that *are not predetermined to form a hydrophobic core*.

For the missing teachings, the Office Action relies upon U.S. Patent No. 5,948,763, to SOTO-JARA et al. The Action asserts that SOTO-JARA et al. disclose the importance of peptide segments found in a protein, said segment comprising a common characteristic of a hydrophobic cluster of hydrophobic amino acids being present within a larger segment strongly predicted to have a β -sheet conformation. The Office Action asserts that, based upon the importance attributed by SOTO-JARA et al. to hydrophobic clusters in the formation of protein structure, that it would have been obvious to combine the teachings of EISENBERG et al. with those of SOTO-JARA et al.

Applicant respectfully disagrees with the rejection. Initially, Applicant agrees with the Office Action that EISENBERG et al. does not disclose that the division of the reference protein be into two or more segments that are predetermined to form a hydrophobic core and into one or more sub segment sequences that are not

predetermined to form a hydrophobic core. Applicant notes that EISENBERG et al.'s disclosure differs from the present invention in at least these ways. Applicant also notes that SOTO-JARA et al. discusses that in its peptides, hydrophobic amino acid residues are involved in the formation of a "hydrophobic cluster." Applicant respectfully submits, however, that a *prima facie* case of obviousness does not result from the combination of teachings.

To establish a *prima facie* case of obviousness, there must be motivation to combine the reference teachings, which in this instance, is lacking. As noted above, EISENBERG et al. fails to teach, at least, that the division of the reference protein be into two or more segments that are predetermined to form a hydrophobic core and into one or more sub segment sequences that are not predetermined to form a hydrophobic core. The Office has admitted that such teachings are absent in EISENBERG et al. and looks to SOTO-JARA et al. for these teachings. However, there is nothing in EISENBERG et al. that would lead to the choice of hydrophobic clusters as being the basis for the division of segments. EISENBERG et al. expresses no preference at all for its segmentation.

SOTO-JARA et al. provides little more than a general recognition of the importance of hydrophobic amino acid residues in the formation of a hydrophobic core of a folded protein. SOTO-JARA et al. does not relate to protein modeling generally, but rather, to the design of peptides that exhibit particular pharmacologic activities. Its comments relating to the importance of hydrophobic residues, while applicable broadly to many proteins, are made in the context of the particular peptides that are being designed and synthesized. It is quite a stretch to argue that its teachings would be

combined with a protein modeling program such as EISENBERG et al.'s to result in a desirability in segmenting a reference protein into segments that are predetermined to form a hydrophobic core and segments that are predetermined not to form a hydrophobic core.

Applicant respectfully submits that there is nothing in either of the cited references that would lead to their combination as suggested by the Office Action. The motivation to combine these teachings is lacking, and in the absence of motivation to combine, the obviousness rejection is untenable.

Applicant also respectfully submits that, despite arguments in the Office Action to the contrary, there would be no expectation of success in the combination as suggested by the Office Action. There is nothing in EISENBERG et al. that would suggest that if one purposefully segmented a reference protein into sequences that are predetermined to form a hydrophobic core and sequences that are predetermined not to form a hydrophobic core, that the method would be successful. And, as noted above, SOTO-JARA et al. relates to the design of particular peptides, and has nothing to do with molecular modeling, so the expectation of success cannot be found in SOTO-JARA et al.


Thus, one can only conclude that the Office Action's statements relating to expectation of success find their basis in Applicant's own disclosure. This approach to combining references finds the reason for the combination, and the success in the combination, in an applicant's own disclosure. This hindsight approach is contrary to the Patent Office's guidance and to U.S. case law as well.

For the foregoing reasons, Applicant respectfully submits that the obviousness rejection is without proper foundation and should be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant submits that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Please charge any deficiencies in fees and credit any overpayment of fees to Deposit Account No. 19-0089.

Respectfully submitted,
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